

1 CLAIMS:

2 1. A method for efficient transmission of TCP/IP headers via a wireless
3 communications link from a sender to a receiver, the method comprising:

4 obtaining TCP/IP packets having associated TCP/IP headers;
5 losslessly compressing the associated headers;
6 feedback-independently transmitting of a plurality of the compressed
7 headers via the communications link;

8 the transmitting comprising:

9 adjusting a sliding window within which the plurality of the
10 compressed headers are transmitted, wherein the adjusting is modeled to
11 react to TCP/IP window-size changes that results from the congestion
12 procedures of TCP/IP;

13 using the sliding window, W-LSB encoding the plurality of the
14 compressed headers;

15 sending the resulting W-LSB encoded plurality of compressed
16 headers.

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19 2. A method as recited in claim 1, further comprising inferentially
20 determining whether there is an inconsistent context between the sender and the
21 receiver.

1 **3.** A method as recited in claim 1, further comprising:

2 inferentially determining whether there is an inconsistent context between
3 the sender and the receiver;

4 if so, then refreshing the context between the sender and the receiver.

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6 **4.** A method as recited in claim 1, wherein the sender is a header

7 compressor (HC) and the receiver is a header decompressor (HD).

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9 **5.** A computer comprising one or more computer-readable media

10 having computer-executable instructions that, when executed by the computer,
11 perform the method as recited in claim 1.

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13 **6.** A computer network comprising a computer comprising one or more

14 computer-readable media having computer-executable instructions that, when
15 executed by the computer, perform the method as recited in claim 1.

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17 **7.** A computer-readable medium having computer-executable

18 instructions that, when executed by a computer, performs the method as recited in
19 claim 1.

1 8. A method for efficient transmission of network transport-layer
2 protocol headers via a communications link, the method comprising:

3 obtaining transport-layer protocol packets having associated transport-layer
4 protocol headers;

5 compressing the associated headers;

6 feedback-independently transmitting of a plurality of the compressed
7 headers via the communications link.

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9 9. A method as recited in claim 8, further comprising inferentially
10 determining whether there is an inconsistent context, wherein an inconsistent
11 context is when one or more headers are not properly received by a receiver on the
12 communications link.

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14 10. A method as recited in claim 8, further comprising:

15 inferentially determining whether there is an inconsistent context, wherein
16 an inconsistent context is when one or more headers are not properly received by a
17 receiver on the communications link;

18 if so, then refreshing the context to make the context consistent.

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20 11. A method as recited in claim 8, wherein, for the compressing, the
21 headers are compressed losslessly.

1 **12.** A method as recited in claim 8, wherein the transmitting comprises:
2 adjusting a sliding window within which the plurality of the compressed
3 headers are transmitted;

4 using the sliding window, W-LSB encoding the plurality of the compressed
5 headers;

6 sending the resulting W-LSB encoded plurality of compressed headers.

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8 **13.** A method as recited in claim 8, wherein the transmitting comprises:
9 adjusting a sliding window within which the plurality of the compressed
10 headers are transmitted, wherein the adjusting is modeled to react to window size
11 changes of the transport-layer protocol that results from the congestion procedures
12 of such transport-layer protocol;

13 using the sliding window, W-LSB encoding the plurality of the compressed
14 headers;

15 sending the resulting W-LSB encoded plurality of compressed headers.

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17 **14.** A method as recited in claim 8, wherein the communications link is
18 wireless.

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20 **15.** A method as recited in claim 8, wherein the network transport-layer
21 protocol is TCP.

1 **16.** A computer comprising one or more computer-readable media
2 having computer-executable instructions that, when executed by the computer,
3 perform the method as recited in claim 8.

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5 **17.** A computer network comprising a computer comprising one or more
6 computer-readable media having computer-executable instructions that, when
7 executed by the computer, perform the method as recited in claim 8.

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9 **18.** A computer-readable medium having computer-executable
10 instructions that, when executed by a computer, performs the method as recited in
11 claim 8.

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13 **19.** A method for efficient transmission of network transport-layer
14 protocol headers via a communications link, the method comprising:

15 transmitting a plurality of compressed transport-layer protocol headers via
16 the communications link;
17 inferentially synchronizing.

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19 **20.** A method as recited in claim 19 further comprising:
20 obtaining transport-layer protocol packets having associated transport-layer
21 protocol headers;
22 compressing the associated headers.

1 **21.** A method as recited in claim 20, wherein, for the compressing, the
2 headers are compressed losslessly.
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4 **22.** A method as recited in claim 19, wherein the synchronizing
5 comprises modeling the encoding upon a congestion procedure of the network
6 transport-layer protocol.
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8 **23.** A method as recited in claim 19, wherein the synchronizing
9 comprises modeling the size of a sliding window to react to window size changes
10 of the transport-layer protocol that results from congestion procedures of such
11 transport-layer protocol.
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13 **24.** A method as recited in claim 19 further comprising inferentially
14 determining whether there is an inconsistent context, wherein an inconsistent
15 context is when one or more headers are not properly received by a receiver on the
16 communications link.
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1 **25.** A method as recited in claim 19 further comprising:
2 inferentially determining whether there is an inconsistent context, wherein
3 an inconsistent context is when one or more headers are not properly received by a
4 receiver on the communications link;
5 if so, then refreshing the context to make the context consistent.

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7 **26.** A method as recited in claim 19, wherein the transmitting comprises:
8 adjusting a sliding window within which the plurality of the compressed
9 headers are transmitted;
10 using the sliding window, W-LSB encoding the plurality of the compressed
11 headers;
12 sending the resulting W-LSB encoded plurality of compressed headers.

1 **27.** A method as recited in claim 19, wherein
2 the transmitting comprises:

3 adjusting a sliding window within which the plurality of the
4 compressed headers are transmitted;

5 using the sliding window, W-LSB encoding the plurality of the
6 compressed headers;

7 sending the resulting W-LSB encoded plurality of compressed
8 headers;

9 the inferential synchronizing comprises modeling the size of the sliding
10 window to react to window size changes of the transport-layer protocol that results
11 from the congestion procedures of such transport-layer protocol.

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13 **28.** A method as recited in claim 19, wherein the communications link is
14 wireless.

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16 **29.** A method as recited in claim 19, wherein the network transport-layer
17 protocol is TCP.

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19 **30.** A computer comprising one or more computer-readable media
20 having computer-executable instructions that, when executed by the computer,
21 perform the method as recited in claim 19.

1 **31.** A computer network comprising a computer comprising one or more
2 computer-readable media having computer-executable instructions that, when
3 executed by the computer, perform the method as recited in claim 19.

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5 **32.** A computer-readable medium having computer-executable
6 instructions that, when executed by a computer, performs the method as recited in
7 claim 19.

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9 **33.** A method for efficient transmission of network transport-layer
10 protocol headers via a communications link, the method comprising:

11 encoding a plurality of compressed transport-layer protocol headers;
12 transmitting the plurality of compressed headers via the communications
13 link within a transmission;
14 inferentially synchronizing such transmission by modeling the encoding
15 upon a congestion procedure of the network transport-layer protocol.

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17 **34.** A method as recited in claim 33 further comprising:
18 obtaining transport-layer protocol packets having associated transport-layer
19 protocol headers;
20 losslessly compressing the associated headers.

1 **35.** A method as recited in claim 33, wherein:

2 the encoding comprises:

3 adjusting a sliding window within which the plurality of the
4 compressed headers are transmitted;

5 using the sliding window, W-LSB encoding the plurality of the
6 compressed headers.

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8 **36.** A method as recited in claim 33, wherein:

9 the encoding comprises:

10 adjusting a sliding window within which the plurality of the
11 compressed headers are transmitted;

12 using the sliding window, W-LSB encoding the plurality of the
13 compressed headers;

14 the transmitting comprises sending the resulting W-LSB encoded plurality
15 of compressed headers.

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17 **37.** A method as recited in claim 33, wherein the communications link is
18 wireless.

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20 **38.** A method as recited in claim 33, wherein the network transport-layer
21 protocol is TCP.

1 **39.** A computer-readable medium having computer-executable
2 instructions that, when executed by a computer, performs the method as recited in
3 claim 33.

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5 **40.** A method for efficient transmission of network transport-layer
6 protocol headers via a communications link, the method comprising:

7 transmitting a plurality of compressed transport-layer protocol headers via
8 the communications link;

9 inferentially determining whether there is an inconsistent context, wherein
10 an inconsistent context is when one or more headers are not properly received by a
11 receiver on the communications link;

12 if so, then refreshing the context to make the context consistent.

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14 **41.** A method as recited in claim 40, wherein the communications link is
15 wireless.

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17 **42.** A method as recited in claim 40, wherein the network transport-layer
18 protocol is TCP.

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20 **43.** A computer-readable medium having computer-executable
21 instructions that, when executed by a computer, performs the method as recited in
22 claim 40.

1 **44.** A transmission system comprising:
2 a transmitter configured to transmit a plurality of compressed transport-
3 layer protocol headers via a communications link to a receiver;
4 an inferential synchronizer.
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6 **45.** A system as recited in claim 44, wherein the inferential synchronizer
7 is configured to inferentially determine whether there is an inconsistent context,
8 wherein an inconsistent context is when headers are not properly received by a
9 receiver on the communications link and if so, then refresh the context to make the
10 context consistent.
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12 **46.** A system as recited in claim 44, wherein the inferential synchronizer
13 is configured to model the size of a sliding window to react to window size
14 changes of the transport-layer protocol that results from congestion procedures of
15 such transport-layer protocol.
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17 **47.** A network computing system comprising a system as recited in
18 claim 44 and a receiver.
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20 **48.** A system as recited in claim 44, wherein the communications link is
21 wireless.
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1 **49.** A system for efficient transmission of network transport-layer protocol
2 headers via a communications link, the system comprising:

3 a memory comprising a set of computer program instructions; and
4 a processor coupled to the memory, the processor being configured to
5 execute the computer program instructions, which comprise:

6 obtaining transport-layer protocol packets having associated
7 transport-layer protocol headers;

8 compressing the associated headers;

9 feedback-independently transmitting of a plurality of the compressed
10 headers via the communications link.

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12 **50.** A system as recited in claim 49, wherein the processor is further
13 configured to execute the computer program instructions, which comprises
14 inferentially determining whether there is an inconsistent context, wherein an
15 inconsistent context is when one or more headers are not properly received by a
16 receiver on the communications link.